Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES
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Ex parte BERND GIROD
and STAFFAN ERICSSON
—————————

Appeal No. 1997-2474
Application No. 08/125,590[1]
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ON BRIEF
—————————

Before THOMAS, HAIRSTON, and BARRY, Administrative Patent Judges.

BARRY, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the final rejection of claims 1-26, 28, 29, and 31. The appellants filed an amendment after final rejection on

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[1] The application was filed on September 23, 1993.

September 11, 1995, which was denied entry. We affirm-in-

part.

BACKGROUND

The invention at issue implements a Discrete Cosine

Transform (DCT) and an Inverse Discrete Cosine Transform

(IDCT) in software. DCTs and IDCTs are used in the field of

image processing to represent signals in a compact format.

Because of the demands that arithmetic operations,

particularly multiplication operations, place on a computer,

conventional software implementations of DCTs and IDCTs have

been slower than hardware implementations.

The invention exploits symmetries of the DCT and IDCT to

improve the speed at which software can process signals using

the Transforms. Based on the symmetries, the DCT and IDCT are

performed using a combination of look-up tables and butterfly

operations, thus employing only a few additions and

subtractions and no multiplications.

Claim 24, which is representative for our purposes,

follows:

    24. A digital signal processing apparatus for
    performing a forward discrete cosine transform,
    comprising:

        means for receiving a digital input signal
    including a sequence of input signal amplitude
    values;   a memory containing look up tables
    having a number of entries equal to a number of
    possible input signal amplitude values, and
    corresponding to values of Nth order forward
    Discrete Cosine Transform basis functions stored at
    memory addresses corresponding to input signal
    amplitude values;

        means for outputting a digital output signal
    including a sequence of up to N output coefficient
    values;

        a central processing unit operatively connected
    to the means for receiving, to the memory and to the
    means for outputting; and

        a control store of central processing unit
    instructions connected so as to provide the
    instructions to the central processing unit, the
    control store containing instructions to address the
    memory as a function of the input signal amplitude
    values received by the means for receiving,
    instructions to sum values obtained by addressing
    the memory so as to form output coefficient values,
    and instructions to provide the output coefficient
    values to the means for outputting.

    The references relied on in rejecting the claims follow:

Duhamel   4,831,574   May 16, 1989
McMillan, Jr. et al.   5,224,062   Jun. 29, 1993
  (McMillan)
Uramoto et al.   5,249,146   Sep. 28, 1993
  (Uramoto)   (filed Mar. 20,
1992).

     Claims 1, 24, 26, and 28 stand rejected under 35 U.S.C.

§ 103 as obvious over McMillan. Claims 2, 3, and 25 stand

rejected under § 103 as obvious over McMillan in view of

Uramoto. Claims 4-23, 29, and 31 stand rejected under § 103

as obvious over McMillan in view of Uramoto further in view of

Duhamel.   Rather than repeat the arguments of the

appellants or examiner in toto, we refer the reader to the

brief and answer for the respective details thereof.

                              OPINION

     In reaching our decision in this appeal, we considered

the subject matter on appeal and the rejections and evidence

advanced by the examiner. Furthermore, we duly considered the

arguments of the appellants and examiner. After considering

the totality of the record, we are not persuaded that the

examiner erred in rejecting claims 1-8, 24, 25, 28, 29, and

31. We are persuaded, however, that he erred in rejecting

claims 9-23 and 26. Accordingly, we affirm-in-part. Our

opinion addresses the grouping and obviousness of the claims.

                    Grouping of the Claims

     As amended at 60 Fed. Reg. 14518 (Mar. 17, 1995), 37

C.F.R. § 1.192(c)(7) was controlling when the appeal brief was

filed. Section 1.192(c)(7) stated as follows.

     For each ground of rejection which appellant
     contests and which applies to a group of two or more
     claims, the Board shall select a single claim from
     the group and shall decide the appeal as to the
     ground of rejection on the basis of that claim alone
     unless a statement is included that the claims of
     the group do not stand or fall together and ...
     appellant explains why the claims of the group are
     believed to be separately patentable. Merely
     pointing out differences in what the claims cover is
     not an argument as to why the claims are separately
     patentable.

In addition, claims that are not argued separately stand or

fall together. In re Kaslow, 707 F.2d 1366, 1376, 217 USPQ

1089, 1096 (Fed. Cir. 1983). When the patentability of

dependent claims in particular is not argued separately, the

claims stand or fall with the claims from which they depend.

In re King, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir.

1986); In re Sernaker, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed.

Cir. 1983).

     Here, the appellants assert that claims 1-13, 24, 25, 28

and 31 should stand or fall together. They also assert that

claims 14-23 and 26 should stand or fall together. The

appellants, moreover, fail to explain whether claims 1-8, 24,

25, 28, 29, and 31 are believed to be separately patentable.

They also fail to explain whether claims 14-23 and 26 are

believed to be separately patentable. Therefore, the claims

stand or fall together in the following groups:

- claims 1-8, 24, 25, 28, 29, and 31
- claims 9-12
- claim 13
- claims 14-23 and 26.

We select claims 24, 9, 13, and 26 to represent the respective

groups. Next, we address the obviousness of the claims.

Obviousness of the Claims

     We begin by finding that the references represent the

level of ordinary skill in the art. See In re GPAC Inc., 57

F.3d 1573, 1579, 35 USPQ2d 1116, 1121 (Fed. Cir. 1995)

(finding that the Board of Patent Appeals and Interference did

not err in concluding that the level of ordinary skill in the

art was best determined by the references of record); In re

Oelrich, 579 F.2d 86, 91, 198 USPQ 210, 214 (CCPA 1978)

("[T]he PTO usually must evaluate ... the level of ordinary

skill solely on the cold words of the literature."). Of

course, every patent application and reference relies on the

knowledge of persons skilled in the art to complement its

disclosure. In re Bode, 550 F.2d 656, 660, 193 USPQ 12, 16

(CCPA 1977). Such persons must be presumed to know something

about the art apart from what the references teach.

In re Jacoby, 309 F.2d 513, 516, 135 USPQ 317, 319 (CCPA

1962). We address the obviousness of the claims in the

following groups:

- claims 1-8, 24, 25, 28, 29, and 31
- claims 9-12
- claim 13
- claims 14-23 and 26.

Claims 1-8, 24, 25, 28, 29, and 31

The appellants make two arguments regarding the

obviousness of claims 1-13, 24, 25, 28, and 31. We address

these seriatim.

First, they argue that McMillan is non-analogous art. (Appeal

Br. at 6-9.) The examiner replies, "appellant's argument ...

appears to be contradicted to [sic] what the appellant claims

in the present invention, in which both DCT and IDCT have

almost the same and/or similar limitations." (Examiner's

Answer at 8.) We agree with the examiner.

     Art is analogous if a reference either is within the

field of an inventor's endeavor or is reasonably pertinent to

the particular problem with which the inventor was involved.

In re Oetiker, 977 F.2d 1443, 1447, 24 USPQ2d 1443, 1445 (Fed.

Cir. 1992); In re Clay, 966 F.2d 656, 658-59, 23 USPQ2d 1058,

1060 (Fed. Cir. 1992).

     Here, the appellants state that their invention "relates

generally to the field of digital image processing systems

...." (Spec. at 2.) McMillan, in turn, "relates to the field

of digital image processing systems ...." Col. 1, ll. 10-11.

The appellants admit "that both *McMillan, Jr. et al.* and the

present invention are directed to image processing systems,"

(Appeal Br. at 5), and "both *McMillan, Jr. et al.* and the

present invention relate to image processing ...." (Id. at

9.) Because McMillan is within the field of the inventors'

endeavor, viz., image processing, the appellants' argument

that the reference is non-analogous art is not persuasive.

     Second, the appellants argue, "Since there is **no**

discussion of implementations of the DCT whatsoever in

McMillan, Jr. et *al.,* and no mention of symmetries found

therein, there is no way to make from *McMillan,* Jr. et *al.* the

present invention ...." (Appeal Br. at 9.)(emphasis added).

They add, "The desire of *McMillan, Jr. et al.* to so limit the

use of memory constitutes a teaching away from the elements of

the instant claims reciting 'precomputing.'" (Id. at 10.)

     The appellants err by attempting to read limitations from

the specification into the claims. "In the patentability

context, claims are to be given their broadest reasonable

interpretations. Moreover, limitations are not to be read

into the claims from the specification." In re Van Geuns, 988

F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993)

(internal citations omitted). Representative claim 24

specifies neither symmetries nor precomputing. Accordingly,

the appellants' reliance on these limitations for

patentability is not persuasive.

The appellants have neglected to address the examiner's

rejection of claim 29. Accordingly, they have not shown error

in the rejection.

Therefore, we affirm the examiner's rejections of claims

1-13, 24, 25, 28, 29, and 31 under 35 U.S.C. § 103. Next, we

address claims 9-12.

Claims 9-12

Regarding the obviousness of claims 9-12, the appellants

argue, "no reference performs combined operations within a

single register ...." (Appeal Br. at 12.) The examiner

offers no reply to the argument. We agree with the

appellants.

Each of claims 9-12 specifies in pertinent part the

following limitations:

        loading a first plurality of values
    corresponding to a plurality of output coefficients
    into distinct locations within a single register
    ...; and

        performing in a single operation an accumulation
    of a second plurality of values with the first
    plurality of values within the single register;
    whereby

        a plurality of output values are accumulated in
    the single register, simultaneously.

Giving claims 9-12 their broadest reasonable interpretation,

we agree with the appellants that each of the claims recites

performing combined operations within a single register.

        The examiner fails to show a teaching or suggestion of

the limitations in the prior art. He merely alleges,

"adjusting values in each table and using a [sic] accumulator

with greater length would have been obvious to a person of

ordinary skill in the art." (Examiner's Answer at 6.) The

allegation does not establish a prima facie case of

obviousness. Therefore, we reverse the examiner's rejection

of claims 9-12 under 35 U.S.C. § 103. Next, we address claim
13.

Claim 13

Regarding the obviousness of claim 13, the appellants
argue, "the use of a bias value as recited in the claim is not
disclosed, taught or suggested by any reference of record."
(Appeal Br. at 12.) The examiner offers no reply to the
argument. We agree with the appellants.

Claim 13 specifies in pertinent part the following
limitation: "adding a bias value to the amplitude values when
the input sample is signed ...."   The examiner fails to
show a teaching or suggestion of the limitation in the prior
art. He merely notes, "Uramoto et al's Fig. 9 shows separate
tables are used for the least and most significant portions,
and it is inherent that the table corresponding with the most
significant portion is addressing only when the most

significant portion having a value other than zero."

(Examiner's Answer at 6.)

The allegation does not establish a <u>prima facie</u> case of

obviousness. Therefore, we reverse the examiner's rejection

of claim 13 under 35 U.S.C. § 103. Next, we address claims

14-23 and 26.

Claims 14-23 and 26

Regarding the obviousness of claims 14-23 and 26, the

appellants argue, "there is no ... suggestion found anywhere

in *McMillan,* Jr. et *al.* or any other reference presently of

record for dividing <u>IDCT input coefficients into</u> a plurality

of symmetry classes and addressing look up tables as recited

in the claims directed to that aspect of the invention related

to IDCTs." (Appeal Br. at 9.) The examiner replies, "The

symmetry characteristic of the present invention are clearly

disclosed in cols. 6, 11 & 12 of Uramoto ...." (Examiner's

Answer at 8.) We agree with the appellants.

Claim 26 specifies in pertinent part the following

limitations:

>   A digital signal processing apparatus for
> performing an inverse discrete cosine transform,
> comprising:
> ...
>   means for outputting a digital output signal
> including a sequence of output values;
> ...
>   a control store of central processing unit
> instructions ... including instructions to sum
> values to obtain parts of the output values
> corresponding to a plurality of symmetry classes
> ....

The examiner fails to show a teaching or suggestion of

the limitations in the prior art. To the contrary, he admits

that the sole reference relied on to reject the claim, viz.,

McMillan, "does not disclose the symmetry characteristic ...."

(Examiner's Answer at 4.) The admission negates a prima facie

case of obviousness. Therefore, we reverse the examiner's

rejection of claim 26 under 35 U.S.C. § 103.

Each of claims 14-23 specifies in pertinent part the

following limitations concerning symmetry:

    A method of producing in a computer including a
processing unit ... an output signal including a
plurality of digitized signal samples by performing
an Inverse Discrete Cosine Transform of an input
signal including groups of N input coefficients,
each input coefficient classifiable into one of a
plurality of symmetry classes, the method comprising
the steps of:

    precomputing for each of N look up tables, a
plurality of table values equal in number to a
number of possible input coefficient amplitude
values times N divided by a number of symmetry
classes ...;

    ...

    summing results segregated by the symmetry
classes into which the input coefficients are
classified, and

    performing at least one vector butterfly
operation corresponding to the plurality of symmetry
classes ....

The examiner admits, "McMillan, Jr. et al. ... does not

disclose the symmetry characteristic that the input samples

can be separately transformed for odd and even portions, then

accumulated to produce the output coefficient as claimed."

(Examiner's Answer at 4-5.) Accordingly, he relies on Uramoto

to teach "that by the symmetry of elements in the transform

matrix, the odd and even input samples can be separately

transformed and combined to produce the output coefficient,

and by doing that the size of the look up table is clearly
reduced." (Id.)

The examiner errs in determining the content of the prior
art. Uramoto teaches a coefficient matrix representation (5)
that "is horizontally symmetrical with respect to columns."
Col. 6, ll. 39-40. Based on this, the representation (5) can
be transformed into another representation (6) comprising two,
smaller coefficient matrices. Id. at ll. 41-43. "[T]he
number of times of multiplication for acquiring output data yj
is reduced to a half in relation (6) as compared to relation
(5)." Id. at ll. 60-62. The examiner does not show how the
reference's general teaching of transforming a matrix based on
symmetry would have suggested the detailed claim limitations
concerning symmetry. Duhamel does not cure this deficiency.

For the foregoing reasons, the examiner has failed to
establish a prima facie case of obviousness. Therefore, we
reverse the examiner's rejection of claims 14-23 under 35
U.S.C. § 103.

We end by noting that the aforementioned affirmances are based only on the arguments made in the brief. Arguments not raised therein are not before us, are not at issue, and are thus considered waived.

<u>CONCLUSION</u>

To summarize, the examiner's rejection of claims 1-8, 24, 25, 28, 29, and 31 under 35 U.S.C. § 103 is affirmed. His rejection of claims 9-23 and 26 under § 103 is reversed. Accordingly, we affirm-in-part.

No period for taking subsequent action concerning this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART


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JAMES D. THOMAS                     )
Administrative Patent Judge         )
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                                    ) BOARD OF PATENT
KENNETH W. HAIRSTON                 )      APPEALS
Administrative Patent Judge         )        AND
                                    )   INTERFERENCES
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LANCE LEONARD BARRY                 )
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